



**ASSOCIATION of
GOVERNMENTS**

MEETING OF THE

ENERGY WORKING GROUP

Main Office

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Riverside County: Jeff Stone, Riverside County • Thomas Buckley, Lake Elsinore • Bonnie Flickinger, Moreno Valley • Ron Lovinridge, Riverside • Greg Pettis, Cathedral City • Ron Roberts, Temecula

San Bernardino County: Gary Oviatt, San Bernardino County • Lawrence Dale, Barstow • Paul Eaton, Montclair • Lee Ann Garcia, Grand Terrace • Tim Jasper, Town of Apple Valley • Larry McCallion, Highland • Deborah Robertson, Rialto • Alan Wagner, Ontario

Ventura County: Linda Parks, Ventura County • Glen Becerra, Simi Valley • Carl Morehouse, San Buenaventura • Toni Young, Port Huene

Orange County Transportation Authority: Art Brown, Buena Park

Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Keith Millhouse, Moorpark

**Tuesday, September 25, 2007
12:30 p.m. – 2:30 p.m.**

SCAG Offices

818 W. 7th Street, 12th Floor

Riverside A Conference Room

Los Angeles, CA 90017

(213) 236-1800

If members of the public wish to review the attachments or have any questions on any of the agenda items, please contact Deby Salcido at 213.236.1993 or salcido@scag.ca.gov

Agendas and Minutes for the Energy Working Group are also available at:

www.scag.ca.gov/rcp/ewg.htm

VIDEO CONFERENCE LOCATION

SCAG, Riverside Office

3600 Lime Street, Suite 216

Riverside, CA 92501

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ENERGY WORKING GROUP

AGENDA

September 25, 2007

1.0 CALL TO ORDER

Honorable
Debbie Cook, Chair

2.0 PUBLIC COMMENT PERIOD

Members of the public desiring to speak on an agenda item or items not on the agenda, but within the purview of the Committee, must fill out and present a speaker's card to the Assistant prior to speaking. A speaker's card must be turned in before the meeting is called to order. Comments will be limited to three minutes. The chair may limit the total time for all comments to twenty (20) minutes.

3.0 REVIEW and PRIORITIZE AGENDA ITEMS

4.0 CONSENT CALENDAR

4.1 Minutes of July 17, 2007

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5.0 DISCUSSION ITEMS

5.1 Pier 400 Project
Attachment

David E. Wright,
Vice-President
Plains All-American
Pipeline, L.P.

20 Minutes

Mr. Wright will provide information for the group's consideration regarding a proposed deepwater crude oil receiving terminal.

5.2 Regional Comprehensive Plan Update

Warren Whiteaker
SCAG Consultant

20 Minutes

Staff will describe the schedule and work plan for the RCP.

5.3 Energy Working Group Next Steps

Jennifer Sarnecki
SCAG Staff

20 Minutes

As requested at the last meeting, staff will take recommendations from the group on future working group activities.

6.0 STUDY SESSION

6.1 Regional Comprehensive Plan Draft Energy Chapter
Attachment

60 Minutes

Staff will take comments on the Draft Energy Chapter.

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SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS

ENERGY WORKING GROUP

AGENDA

7.0 CHAIR'S REPORT

Hon. Debbie Cook

8.0 STAFF REPORT

9.0 FUTURE AGENDA ITEMS

Any Committee member or staff desiring to place items on a future agenda may make such request.

10.0 ANNOUNCEMENTS

11.0 ADJOURNMENT



Energy Working Group

Minutes for July 17, 2007

The following minutes are a summary of actions taken by the Energy Working Group.

The Energy Working Group held its meeting at the Southern California Association of Governments offices in Los Angeles. The meeting was called to order by Chair Debbie Cook, City of Huntington Beach.

Members Present

Representing

Gene Beck	Envirotech
Brad Bergman	SGV Energywise Partnership
Brian Brennen	VCOG
Howard Choi	L.A. County
Debbie Cook	Huntington Beach
Darrell Clarke	Sierra Club
Woody Clark	LACCD
Margaret Clark	Rosemead
Keith Hanks	Azusa
Lewis Lem	PB Consultants
Mark McDannel	L.A. County Sanitation District
Felix Oduyemi	SCE
Catherine Showalter	UCLA Extension
John Skolnik (Phone)	Jack Fawcett Associates
Lori Van Arsdale	Hemet
Jim Stewart	Sierra Club
Paul Wuebben	AQMD

1.0 CALL TO ORDER

Debbie Cook, Chair, called the meeting to order at 10:00 a.m.

2.0 PUBLIC COMMENT PERIOD

3.0 REVIEW AND PRIORITIZE AGENDA ITEMS

4.0 CONSENT CALENDAR

4.1 Minutes of June 19, 2007

The minutes of June 19, 2007 were approved.

5.0 DISCUSSION ITEMS

5.1 Climate Change and Transportation

Lewison Lem, PB Consultants, provided a presentation on transportation strategies to address climate change. They are currently working on state climate action plans and working with the Western Governors Association on the Western Regional Climate Initiative. Transportation is currently lagging behind other petroleum related resources. He provided the highlights of the action plans and implementation strategies and expressed that it will take a portfolio approach to achieve attainment of goals.

5.2 Review of Energy Consultant Work

Jennifer Sarnecki, SCAG Staff, provided a sample of SCAG's draft work product which describes each of the energy measures that have been recommended for inclusion of the final product. The consultant has provided input on the Energy Chapter and performance outcomes. They are also developing a Best Practices Guide that will help cities with implementation of the measures.

Woody Clark raised concerns with the following items that are not addressed: A law or regulation that states that we will do what is enforceable and will abide by it, no synergy with the report and AB 32 or SB1, lack of "mass transit", and economic analysis.

John Skolnik responded that the forecasts will be taking into account AB32 and SB1 and included in the report. There will also be several options aimed at increasing mass transit and its funding. He also indicated that there are several alternative energy methods that are becoming more economical and affordable that can be pursued as alternatives.

Darrell Clark raised concern with how this work can be done to make it work and be effective.

Jennifer Sarnecki responded that this would be done through "Best Practices" and the Intergovernmental Review Process where we receive large regional significant projects for our input. So these measures are a huge step to get us where we need to be, so when we get those projects we are able to provide concrete policy guidance and mitigation measures.

5.3 Regional Comprehensive Plan Energy Chapter

Jennifer Sarnecki, SCAG Staff, provided an overview of the Regional Comprehensive Plan (RCP) and purpose of the chapters and action plan of the RCP. The Energy Chapter addresses peak oil and energy constraints. The goals of the Energy Chapter are to reduce the consumption of non-renewable energy and increase the share of renewable energy in the region.

Felix Odeyumi, SCE, suggested that a goal be added addressing Coal Generation. He also stated that regarding Bullet #2 he believes that the state will require 30% renewable by 2020 and that legislation to that effect will be passed sometime next year, 2010 will remain the same at 20%. The new legislation will cover independently-owned utilities and municipal-owned utilities within the state of California.

After discussion, it was agreed to add on the 30% by 2020 as a second tier to bullet #2 and stay with bullet #1. It was also noted that finance mechanisms will be discussed in the actions.

6.0 CHAIR'S REPORT

7.0 STAFF REPORT

8.0 FUTURE AGENDA ITEMS

The group requested to discuss the future role of the Energy Working Group at the next meeting.

9.0 ANNOUNCEMENTS

10.0 ADJOURNMENT

There being no further business, the meeting was adjourned at 12:00 Noon. The next meeting will be determined at a later date.

MEMO

DATE: September 25, 2007

TO: Energy Working Group

FROM: Jennifer Sarnecki, AICP, Senior Planner, (213) 236-1829, sarnecki@scag.ca.gov

SUBJECT: Pier 400 Project

BACKGROUND:

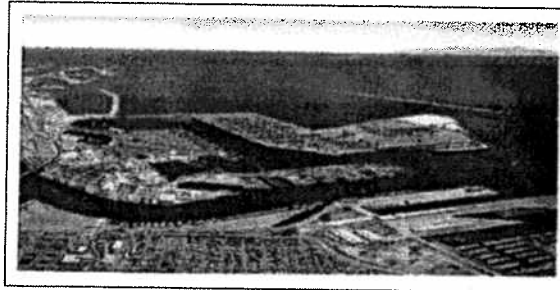
The Working Group will receive a presentation on a proposed deepwater crude oil receiving terminal at Pier 400 in the Port of Los Angeles. Staff is requesting the Energy Working Group's input on the merits of the proposed project.

Attachment:

PowerPoint presentation



Pier 400 – Berth 408 Liquid Bulk Petroleum Terminal



Southern California Association of Governments
Energy Working Group
September 25, 2007



Pier 400 – Berth 408 – Port of Los Angeles

- Project is the development of a new world scale deep water crude oil import terminal
- Facility will be developed in the Port of Los Angeles
- Project consists of a marine dock, shore side pumps, series of underground pipelines and 4 million barrels of marine receipt petroleum storage tankage
- Nearly all of the new facilities will be built on POLA property
- Facility will have initial capacity to accommodate over 25% of the Southern California regional crude oil demand





Plains – Pacific Merger

- Project was started by Pacific Energy Partners, L. P.
- Merger took place on November 15, 2006
- Plains All American Pipeline, L.P. (NYSE "PAA") acquired the general partner interest in Pacific Energy Partners ("PPX"), exchanged PAA units (limited partner interests) for PPX units at 0.77/1.0 ratio
- PPX merged into PAA
- The combined company has an estimated market value of over \$6.0 billion
- PAA Operations include transportation, storage, terminalling and marketing of crude oil, refined products, liquefied petroleum gas and other natural gas-related petroleum products in the United States and Canada



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Pier 400 Marine Terminal Project



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Pier 400 Details

- The 81 feet of deep-water terminal at Pier 400 will accommodate the newest and largest tankers
- Designed to accommodate up to 325 MDWT vessels
- 4 million barrels of new petroleum storage
- System will accommodate a variety of types of oil through efficient marine receipt storage
- Estimated 250,000 barrels per day of startup throughput capacity that grows to meet demand over time
- High capacity pipeline connections to local refineries, other Plains' systems and other 3rd party tank farms and pipelines in the Port of Los Angeles area



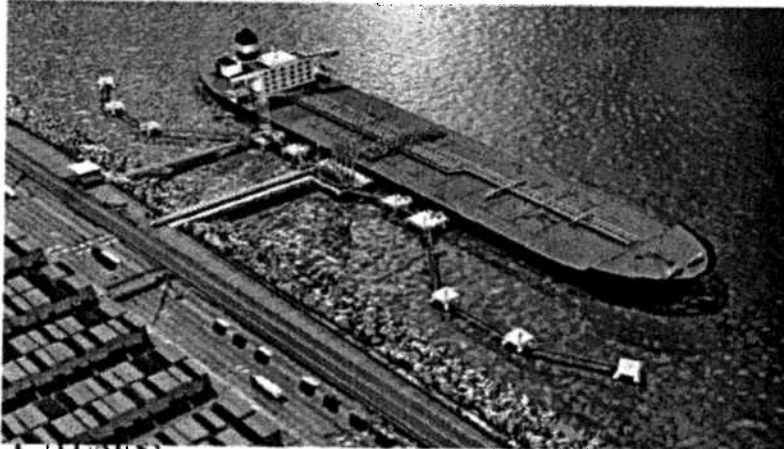
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Pacific L.A. Marine Terminal LLC

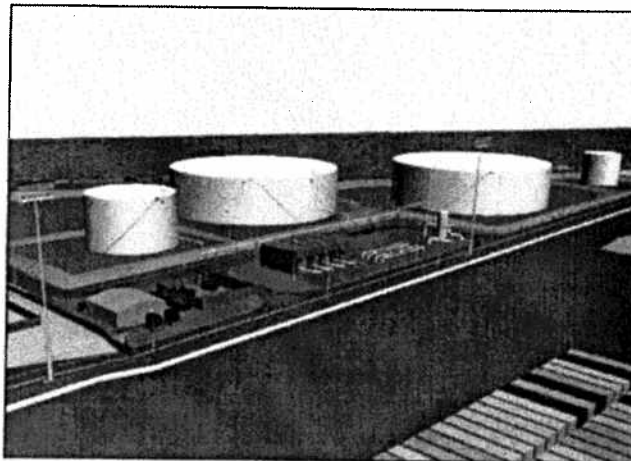
Berth 408 View with VLCC



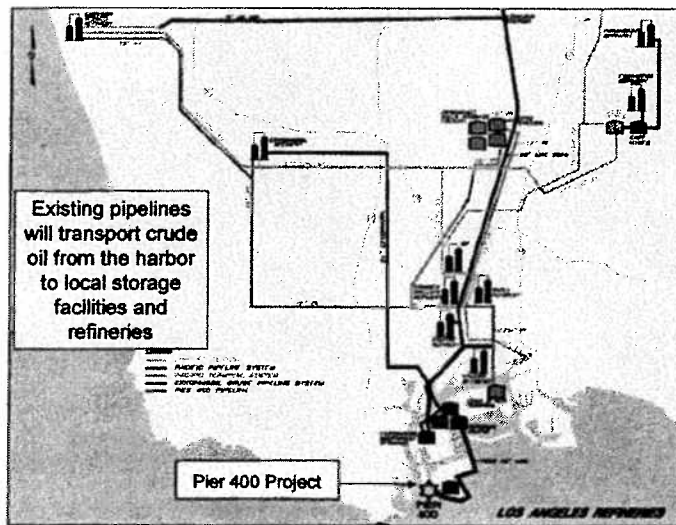
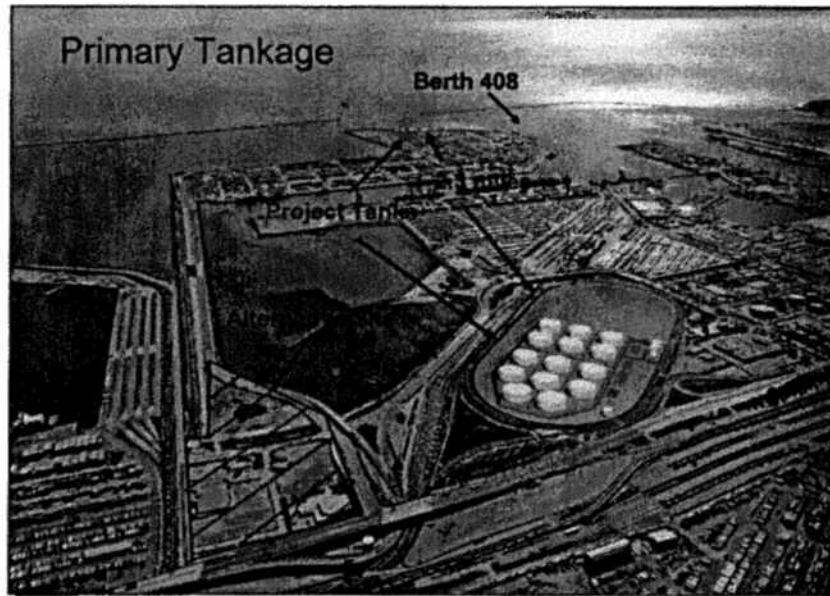
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Pacific L.A. Marine Terminal LLC

Berth 408 – Site 1 – Tankage and Pumps



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Strategic Project

- Vital for the Southern California economy
- First new petroleum terminal in 30 years
- Deepest safe harbor in the U.S. – 81 feet of depth
- The project has the initial capacity to supply 25% of today's petroleum needs of Southern California
- Significant strategic value to California and the South West United States
- Local production is falling off faster than anticipated
- Representatives from California Energy Commission have expressed continued concern about California's import situation



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Project Addresses Key Environmental Issues

Air Quality

- Will meet objectives of Ports' Clean Air Action Plan (CAAP)
- Residential health risk is less than 4 in one million PM
- Offsets 120% of operational air emissions (AQMD Requirement)
- Incorporates shoreside pumps
- Efficient operation minimizes time in port
- Will use AMPing or equivalent
 - Phase in over time
- Uses low sulfur fuels
 - Begins at 40 nautical miles
 - Main engine switching – protocol to be established
 - Auxiliary engines and boilers (main engines if required)
 - Phase in over time
- Reduces ship speed – 12 knots/hour from 40 nautical miles
- No trucking – No Trains
- Specific Details will be discussed in pending Draft EIR/EIS



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Facing the Future

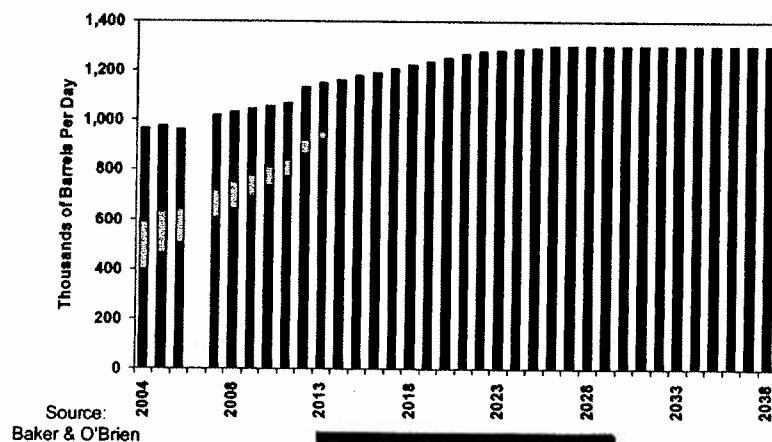
- Historical sources of crude oil from California and Alaska are running out
- Los Angeles basin is projected to need twice as much oil by 2015
- Even if conservation efforts are successful, and demand remains constant, we will still need to find replacement sources
- The current petroleum import infrastructure is near capacity
- We must have the critical new infrastructure to accept these imports
- Future oil supply will come from distant locations in large ships



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Southern California Crude Oil Demand



Source:
Baker & O'Brien

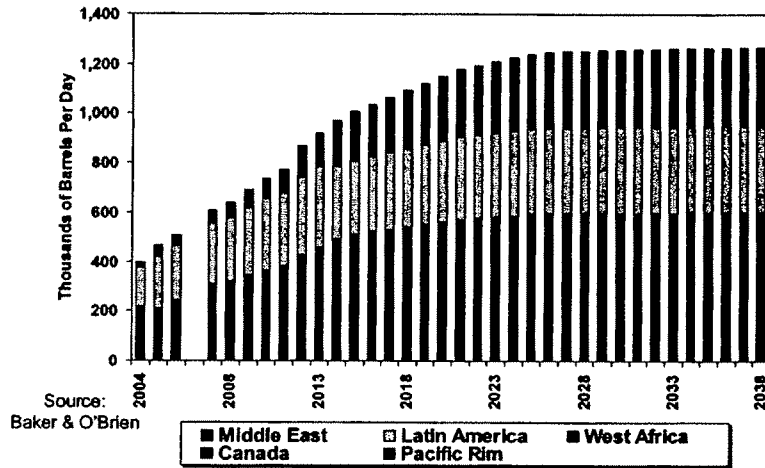


Base Case: Annual Capacity Creep
2006-2021: 1.25%; 2022-2026: 0.50%; 2027-2038: 0.00%.

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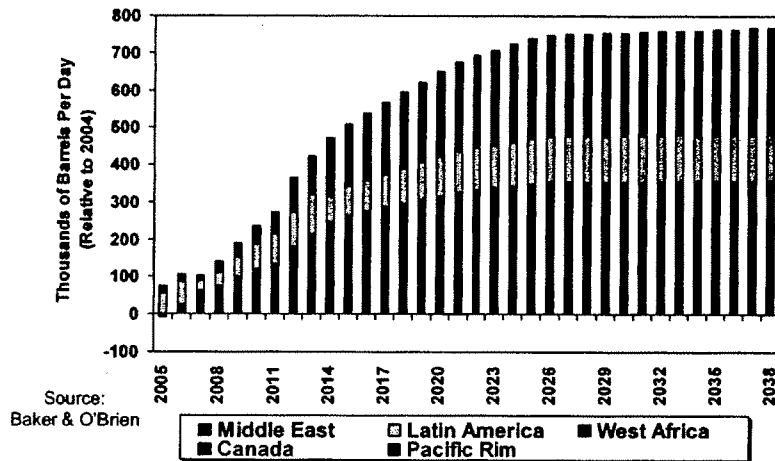
Sources of Imports



15



Incremental Imports to Southern California



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Project Schedule

- Project Application to POLA – April 2003
- POLA/USACE – Notice of Project – June 2004
- Expect Draft EIR in November or December of 2007
- Four to five months for POLA Approval
- Four to five months with Mayor, City Hall and City Council
- Start Construction – August/September 2008
- Finish Construction – 2010



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Implications for Local Economy

- \$418 million project (includes POLA dock design/construction)
- Project Labor Agreement (PLA)
- Letter to POLA Commission regarding union operation
- Employment - at least –
 - 4,800 full year equivalent union construction jobs
 - Pipe Trades, Boilermakers, Electricians, Piledrivers, etc.
 - 172 full time direct and indirect permanent jobs
 - Tank farm operations, vessel tie ups, clerks, maintenance personnel
- Provides significant new tax base for City, County and State
- Continuation of high paying jobs at regional refineries



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Commercial Update

- Current construction cost estimate:
 - \$368+ million (Plains investment) Estimate up \$50 million from last year
 - \$ 50+ million (POLA – Plains All American Liability)
- Finalizing on another cost estimate (upward) revision
- Capacity fully subscribed
- Reviewing options for additional capacity



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Plains All American Pipeline L.P. NYSE: PAA

www.paalp.com

www.Pier400Berth408.info

333 Clay Street
Suite 1600
Houston, TX 77002
(713) 646-4100

5900 Cherry Avenue
Long Beach, CA 90805
(562) 728-2800



MEMO

DATE: September 25, 2007

TO: Energy Working Group

FROM: Warren Whiteaker, Consultant to SCAG, (213) 236-1939, whiteake@scag.ca.gov

SUBJECT: Regional Comprehensive Plan Update

BACKGROUND:

Over the past year and a half, the Energy Working Group has assisted staff in the development of the Energy Chapter of the Regional Comprehensive Plan (RCP), specifically the performance outcomes and action plan. Staff has provided regular updates on the status of the RCP.

The intent of this presentation is to inform the Energy Working Group of next steps in development of the RCP. Key dates are provided below. Members of the Working Group are encouraged to attend future meetings and provide comments. Staff will forward details as information becomes available.

Preliminary Schedule:

- October 4, 2007 (SCAG Main Office, 9:30 a.m.)
 - RCP Workshop (Combined workshop with the Regional Transportation Plan)
- Week of October 15, 2007 (SCAG Main Office, Date, Time: TBD)
 - RCP Task Force review of Preliminary Draft RCP
- November 1, 2007 (SCAG Main Office, Time: TBD)
 - Staff will request release of the Draft RCP
- November 2007 – February 2008
 - Comment period
- January 2008
 - SCAG will hold a conference on sustainability and the RCP
- February 2008
 - Proposed adoption of RCP

MEMO

DATE: September 25, 2007

TO: Energy Working Group

FROM: Jennifer Sarnecki, AICP, Senior Planner, (213) 236-1829, sarnecki@scag.ca.gov

SUBJECT: RCP Energy Chapter

BACKGROUND:

The purpose of this work session is to provide feedback to staff on the attached preliminary draft Energy Chapter. The Working Group's comments will be reviewed and incorporated into the next draft to be reviewed by the Regional Comprehensive Plan Task Force in mid-October.

This preliminary draft Energy Chapter has been written to address concerns raised by the Regional Council, the Energy and Environment Committee, the Regional Comprehensive Plan Task Force as well as the Energy Working Group. SCAG is showing leadership in an area that most other regions have not yet addressed in the same way.

In summary, the preliminary draft Energy Chapter:

- is a first of its kind, comprehensive energy policy framework for the SCAG region;
- incorporates research from SCAG's Energy Conference and subsequent reports on energy uncertainty and potential strategies to reduce consumption;
- identifies bold energy goals that help define what a sustainable energy future would be for the region;
- includes aggressive but achievable performance outcomes to reduce our dependence on fossil fuels and combat climate change; and
- provides an Action Plan, which was developed cooperatively with SCAG policy committees, task forces and the Energy Working Group.

Attachment:

Preliminary Draft Energy Chapter

This Energy Chapter, as presented, is preliminary and has not been subject to formal approval of the SCAG Regional Council or any Committee. The Energy and Environment Committee has approved release of the preliminary goals, outcomes and actions for public review, and is being made available at this time for information and for comments.

RCP Draft ENERGY CHAPTER

"We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard, because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one which we intend to win."

—President John F. Kennedy, September 1962

1. Introduction

a. The Challenge

A clean, stable and sustainable source of energy for Southern California is critical to supporting a resilient region. In developing future plans, SCAG must fully weigh and consider energy supply, consumption, and environmental impacts such as greenhouse gas emissions. California relies on petroleum-based fuels for 96 percent of its transportation needs.¹ The SCAG region consumes over 23 million gallons of petroleum per day, roughly half of California's oil consumption.² SCAG's vehicle fuel consumption has increased 20 percent over the last ten years.³ Furthermore, only 15 percent of the electricity consumed in the region is generated from a renewable source.⁴ SCAG forecasts the region will add over 6 million people, 2 million households, and 3 million jobs between 2000 and 2030. These additional people, households, and jobs will place new demands on non-renewable energy production and increase the amount of greenhouse gas emissions generated in the region.

There is the growing realization that we are living in an energy constrained world. Both environmental and geopolitical factors are causing energy experts to question the long term viability of a petroleum-based energy future. In addition, concerns about global climate change have motivated action at the federal, state and local levels. Continued oil price fluctuations and supply constraints have helped raise awareness about our dependence on imported petroleum. U.S. currently imports 58 percent of its petroleum and California imports approximately 40 percent of its petroleum. The U.S. represents 5 percent of the world's population, but consumes 25 percent of the world's oil.⁵ In California, oil production peaked in 1985. Since then, the share of oil from foreign imports has increased rapidly, from below 10 percent in 1995 to over 40 percent in 2006, as shown in the chart below.⁶ In 2005, California

¹ California Environmental Protection Agency (3 April 2006), Climate Action Team Report to Governor Schwarzenegger and the Legislature.

² California Department of Transportation, Division of Transportation System Information. (December 2006). California Motor Vehicle Stock, Travel and Fuel Forecast.

³ California Energy Commission, (September 2005) California Energy Demand 2006-2016 Staff Energy Demand Forecast 2005, CEC-400-2005-034-SF-ED2.

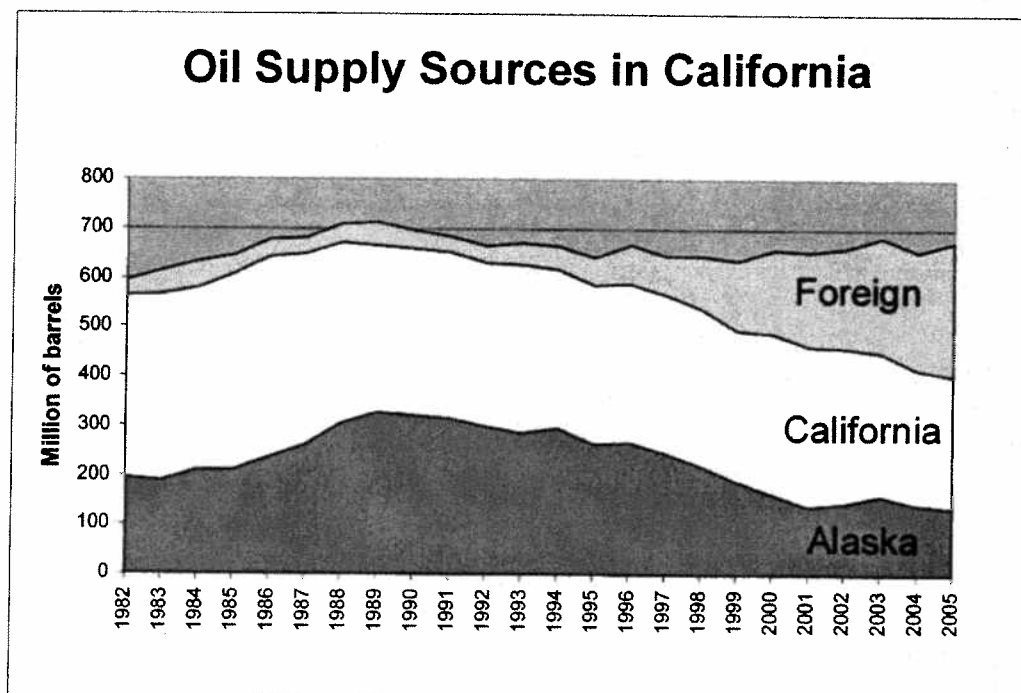
⁴ Southern California Association of Governments. State of the Region 2006.

⁵ United States Census Bureau and United States Energy Information Agency, Basic Petroleum Statistics, (October 2006). Retrieved June 5, 2007 from <http://www.eia.doe.gov/neic/quickfacts/quickoil.html>.

⁶ California Energy Commission, Oil Supply Sources to California Refineries. Retrieved December 20, 2006 from http://www.energy.ca.gov/oil/statistics/crude_oil_receipts.html

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received 35 percent of its foreign imports from Saudi Arabia, 24 percent from Ecuador, and 12 percent from Iraq.⁷ Globally, increasing demand from the growing economies of India and China will further constrain world oil supplies. According to the U.S. Energy Information Agency (EIA), India has become the fifth largest consumer of oil in the world during 2006.⁸ China is the world's most populous country and the second largest energy consumer behind the United States.⁹



Source: California Energy Commission, Oil Supply Sources to California Refineries. Retrieved December 20, 2006 from http://www.energy.ca.gov/oil/statistics/crude_oil_receipts.html

There are additional concerns of some that the nation's dependence on oil, especially from the Persian Gulf, requires a U.S. military presence.¹⁰ As identified by the United States Government Accountability Office, oil production could be shut down by wars, strikes, and other political events in many countries with proven oil reserves. For example, the countries of Iran, Iraq, Nigeria and Venezuela contain one-third of worldwide reserves but face high levels of political risk. Furthermore, countries with

⁷ California Energy Commission, Foreign Sources of Crude Oil Imports to California 2005. Retrieved February 8, 2007 from http://www.energy.ca.gov/oil/statistics/2005_foreign_crude_sources.html

⁸ United States Energy Information Agency, Country Analysis Briefs. Retrieved February 23, 2007 from <http://www.eia.doe.gov/emeu/cabs/India/Background.html>

⁹ United States Energy Information Agency, Country Analysis Briefs. Retrieved February 23, 2007 from <http://www.eia.doe.gov/emeu/cabs/China/Background.html>

¹⁰ Council on Foreign Relations, National Security Consequences of U.S. Oil Dependency. Report of an Independent Task Force (2006). Retrieved March 20, 2007 from <http://www.cfr.org/content/publications/attachments/EnergyTFR.pdf>

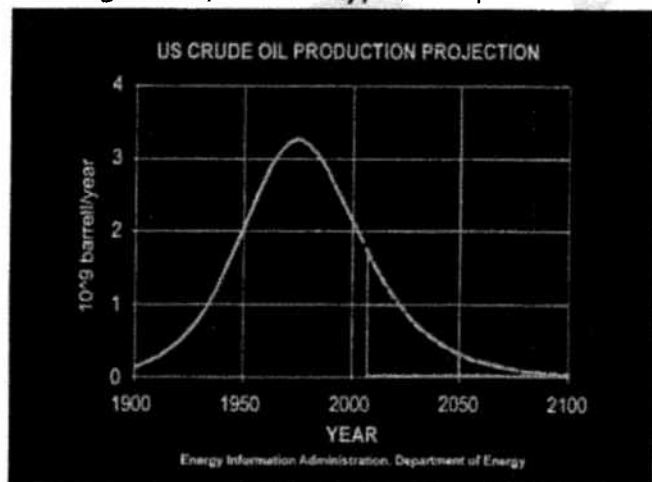
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medium to high levels of political risk held 63 percent of proven worldwide oil reserves.¹¹

Oil is a finite and non-renewable resource and some of the oil remaining in the ground can only be accessed by using complex and costly technologies that present greater environmental challenges than previous technologies used for most of the oil produced to date. Enhanced oil recovery (EOR) technologies are much costlier than conventional production methods due to the additional energy required to perform the tasks and create environmental concerns associated with the greenhouse gas emissions associated with producing that energy.

It is uncertain how future energy consumption trends will be sustained with the current political, environmental and technological constraints. The U.S. Department of Energy forecasts that world energy consumption is projected to increase by 57 percent from 2004 to 2035¹² and that U.S. consumption of liquid fuels is projected to increase by 30 percent between 2005 and 2030, from 21 million barrels per day to 27 million barrels per day. Most of the U.S. increase is anticipated in the transportation sector, which is projected to account for 73 percent of total liquid fuels consumption in 2030, up from 67 percent in 2005.¹³

Our reliance on petroleum for our energy needs is even more problematic because of the global trend toward an inevitable turning point: the peak and then decline of global oil production. Peak oil is the point of maximum oil production whether from a single well, a country, or the planet as a whole. The maximum point of production is



expected to happen when about half or slightly more of the ultimately recoverable oil has been produced. To be clear, peaking does not mean "running out." Rather, it indicates the point where global production can no longer be maintained or increased. Production will begin to decline, year after year.

The analyses of geophysicist M. King Hubbert suggest that one new barrel of oil is being found for every four barrels being consumed. Hubbert correctly predicted the 1971 peak in U.S. production as shown in the graphic from

¹¹ United States Government Accountability Office, Crude Oil: Uncertainty about Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production. (February 2007) GAO-07-283.

¹² United States Department of Energy, Energy Information Administration. International Energy Outlook 2007 (May 2007) 7 Retrieved June 5, 2007 from <http://www.eia.doe.gov/oiaf/ieo/index.html>

¹³ United States Department of Energy. (February 2007). Annual Energy Outlook 2007 with Projections to 2030. Retrieved June 12, 2007 from <http://www.eia.doe.gov/oiaf/aeo/index.html>.

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the U.S. Energy Information Administration. Hubbert further predicted that sometime between 2005 and 2025, world oil production would reach a peak and begin a sharp decline.¹⁴

However, the projections of when worldwide oil will peak vary widely because there is disagreement over how much oil is left in the ground. One oil depletion model developed by Colin Campbell, projected a peak in all oil types in 2007. The U.S. Energy Information Administration stated that peaking of world oil production is not anticipated until after 2030 but that the political, economic and environmental circumstances will shape developments in oil supply and demand.¹⁵ As stated in a report sponsored by the U.S. Department of Energy, the wide range of peak oil forecasts presents a very difficult dilemma for policy makers. On one hand, action could be delayed until there is a consensus from forecasters, however that is unlikely given the strongly held divergent views. Waiting to take action could prove costly and result in severe consequences. Initiating a mitigation crash program 20 years before peaking would offer the possibility of avoiding a world liquid fuels shortfall and significant economic hardship.¹⁶

A fundamental problem in predicting oil peaking is the poor quality of and possible political biases in world oil reserves data. The recent range of estimates varies from late 2005 to a belief that it will never happen. Most estimates are based on different geological assumptions and investments in expanded oil production. In addition, the reserves reported by the Organization of the Petroleum Exporting Countries (OPEC) lack transparency and independent verification.^{17,18}

The International Energy Agency reported in July 2007 that the world will face an oil supply "crunch" in the next five years. This is due to faster than expected falls in supply in mature areas such as the North Sea and Mexico and new prospects in Russia are experiencing long delays. As a result, oil supply will increase approximately 1 percent annually while demand will grow at an annual rate of 2.2 percent.¹⁹

The world supply crunch will impact California and the SCAG region. A fuel shortage will take a toll on California's economy as consumers are spending more of their household income on gasoline than ever before. High fuel prices also reduce profit margins for the manufacturing and industrial sectors, which pass the higher cost of their goods and services to consumers. Since September of 2004, the monthly

¹⁴ Udall, R. and Andrews, S. (1999, January). When will the joy ride end? A petroleum primer. Hubbert Center Newsletter, 99(1), 1-8.

¹⁵ United States Department of Energy, Energy Information Administration. International Energy Outlook 2006 (June 2006) page 29. Retrieved February 23, 2007 from [http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2006\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2006).pdf)

¹⁶ Robert L. Hirsch, Roger H. Bezdek, and Robert M. Wendling, Peaking of World Oil Production: Impacts, Mitigation and Risk Management, U.S. Department of Energy, National Energy Technology Laboratory. February 2005.

¹⁷ Hirsch, Robert L., (2007, April). Peaking of World Oil Production: Recent Forecasts. World Oil Magazine, Vol 228 No 4.

¹⁸ OPEC Members include Algeria, Angola, Indonesia, Iran, Iraq, Kuwait, SP Libyan AJ, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, Venezuela

¹⁹ International Energy Agency (July 2007). Medium Term Oil Market Report

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average price of gasoline has increased by more than 35 cents per gallon, costing consumers an additional \$6.1 billion for gasoline.²⁰

There is also growing demand for natural gas, which makes up 25 percent of the nation's energy use and is a clean source of electricity. Natural gas follows a production curve similar to oil. Some research has shown a world peak in natural gas a decade or two later than oil. However, the U.S. and California could experience the effects sooner than that. North American gas production appears to have peaked in the past few years and, unlike oil, it is more difficult and expensive to import replacement natural gas from overseas – it has to be liquefied for transport and then re-gasified for distribution.²¹

The U.S. Energy Information Agency predicts that natural gas prices will remain high through 2030. Furthermore, the U.S. will lose its main source of natural gas imports by 2010. The decline of Canada's largest producing basin, the Western Sedimentary Basin, coupled with an approximately 2 percent projected average annual growth in Canada's domestic consumption, leaves less Canadian natural gas available for export to the United States and California.²² In California, natural gas has become the preferred source of electricity generation, supplying over 40 percent of California's power.²³ In addition, California imports 23 percent of its natural gas from Canada.²⁴

In addition to the uncertainty regarding fossil fuels supplies, there is also uncertainty about how the climate change will alter economies and ecosystems at the global, regional and local levels. Recent scientific consensus about human's role in causing climate change has informed the energy debate at the state, national, and international levels. Transportation is the largest source of greenhouse gas emissions in California, representing 41 percent of emissions. California is the second largest emitter of GHG emissions in the United States, next to Texas. Only nine nations have greater total emissions than the state of California. In 2004, California produced 492 million gross metric tons of carbon dioxide – equivalent GHG emissions, including imported electricity and excluding combustion of international fuels and carbon sinks or storage.²⁵ Climate change poses serious risks to our economy, water supply, biodiversity, and public health. These potentially catastrophic impacts have raised the

²⁰ California Energy Commission. (November 2005). Integrated Energy Policy Report. CEC-100-2005-007CMF

²¹ City of Portland Office of Sustainable Development, Bureau of Planning, and Department of Transportation. Peak Oil Task Force Briefing Book (July 25, 2006).

²² United States Department of Energy, Energy Information Administration. International Energy Outlook 2006 (June 2006) pp. 37 – 49. Retrieved February 23, 2007 from [http://www.eia.doe.gov/oiaf/ieo/pdf/0484\(2006\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2006).pdf)

²³ California Energy Commission, 2006 Gross System Electricity Production. (April 2007) CEC-300-2007-007. Retrieved June 5, 2007 from http://www.energy.ca.gov/electricity/gross_system_power.html

²⁴ California Gas Reports, FERC Form 2, QFER Form 6a and 10a, California Department of Conservation Division of Oil and Gas - Annual Report of the State Oil and Gas Supervisor. Retrieved June 5, 2007 from http://www.energy.ca.gov/naturalgas/statistics/gas_supply_by_source.html.

²⁵ California Energy Commission, Inventory of Greenhouse Gas Emissions and Sinks: 1990-2004 Final Staff Report. (December 2006) CEC-600-2006-013-SF. Retrieved March 26, 2007 from <http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF>

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concern of climate change and led to new local and state efforts to reduce the amount of greenhouse gas emissions released into the atmosphere. The landmark legislation, AB 32 or the Global Warming Solutions Act, requires reduction of the state's greenhouse gas (GHG) emissions to 1990 levels by 2020. This emissions target is equal to a 25% reduction from current levels. Longer term targets have also been set through Executive Order S-3-05, which calls for a reduction of GHG emissions to 80% below 1990 levels by 2050.

Options to Reduce Energy Consumption

This chapter lays out a strategy to reverse the current trends and diversify our energy supplies to create clean, stable, and sustainable sources of energy that address energy uncertainty. This plan includes strategies that the region can take to reduce fossil fuel consumption and increase the use of clean, renewable technologies. SCAG will continue to work with stakeholders at the federal, state, regional and local levels to promote these policies and encourage their implementation. Leadership is needed to coordinate and provide an ongoing forum for local and regional programs to implement an energy savings program.

As stated in the 2006 State of the Region, we can prepare for these inevitable energy challenges by encouraging participation in the neighborhood community, reinvesting in public transportation, and revising land use, zoning and building codes to optimize the consumption of our energy resources. There are numerous strategies that the public sector can undertake to address our energy challenges. These make up the bulk of the proposed Action Plan to promote a more sustainable energy supply.

Land Use and Building Design

Strategies to reduce energy consumption include both where development occurs and how it is designed. Land use patterns have shaped energy use by increasing the amount of travel necessary to reach jobs and services. This growth pattern has resulted in an increase in vehicle miles traveled (VMT) at a rate of more than 3 percent a year between 1975 and 2004.²⁶ Increased VMT results in additional demand for petroleum and greenhouse gas emissions. As such, transportation accounts for 41 percent of the state's greenhouse gas emissions. Building design and housing types also have a strong relationship to energy use and are thus, a strong focus of this chapter. For example, residents of single family detached housing have been found to consume 22 percent more energy than those of multifamily housing and 9 percent more than those of single-family attached housing.²⁷ SCAG has commissioned research to identify effective strategies to reduce energy use, with an emphasis on land use. The discussion that follows is a summary of the findings.

²⁶ California Department of Finance. (December 1998) Race/Ethnic Population with Age and Sex Detail, 1970-2004 and U.S. Federal Highway Authority, (2005) Highway Statistics 1975-2004.

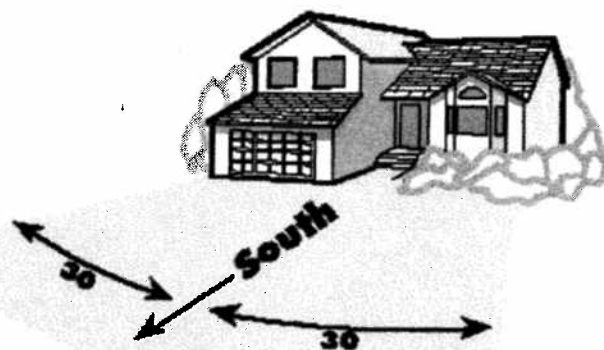
²⁷ Rong, Fang. (2006) Impact of Urban Sprawl on U.S. Residential Energy Use. University of Maryland. Retrieved from <http://hdl.handle.net/1903/3848> on September 14, 2007.

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Mixed land use (i.e., residential developments near work places, restaurants, and shopping centers) with access to public transportation has been shown to save consumers up to 512 gallons of gasoline per year. It is estimated that households in transit-oriented developments drive 45 percent less than residents in auto-dependent neighborhoods.²⁸ With this reduction, there is less overall energy consumption and less greenhouse gas emissions from personal vehicles. Going hand-in-hand with mixed-use development, encouraging the development of pedestrian corridors and bike trails that connect residents to work sites, shops, and recreational opportunities, communities can realize a reduction of personal vehicle use and fuel consumption.

Neighborhood energy systems allow communities to generate their own electricity and offer potential advantages such as cost reductions and energy savings up to 40 percent.

Orienting streets and buildings for best solar access could significantly reduce energy requirements throughout the life of a building. Streets should be designed to take advantage of passive solar heating and most buildings should be oriented such that the long axis runs east/west. The southern most face of the building should face within 30 degrees of south.



The southern most face of the building should face within 30 degrees of south.
Source: Oikos: Green Building Source <http://oikos.com/esd/42/solar.html>

Interest in **green buildings** has been growing for some time, as the impacts of buildings on the environment have come into clearer focus and a broader concern has developed regarding environmental sustainability. Green building standards go well beyond energy efficiency, involving usage of renewable resources and reduced waste generation and water usage. Such standards can reduce local environmental impacts, regional air pollutant emissions, and global greenhouse gas emissions.

Cost is a main consideration when undertaking improvements to building energy efficiency. It may cost more to provide energy-efficient building components and systems. Initial costs can be a hurdle even when the installed systems will save money over the life of the building. Energy efficiency measures can reduce initial costs, for example, by reducing the need for oversized air conditioners to keep buildings comfortable. Undertaking a more comprehensive design approach to building sustainability can also save initial costs through reuse of building materials and other means.

²⁸ Transportation Demand Management Encyclopedia. "Transit Oriented Development." Victoria Transport Policy Institute.

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A comprehensive and persuasive study of the value of green building savings is the 2003 report to California's Sustainable Building Task Force. In the words of the report:

"While the environmental and human health benefits of green building have been widely recognized, this comprehensive report confirms that minimal increases in upfront costs of about 2% to support green design would, on average, result in life cycle savings of 20% of total construction costs -- more than ten times the initial investment. For example, an initial upfront investment of up to \$100,000 to incorporate green building features into a \$5 million project would result in a savings of \$1 million in today's dollars over the life of the building."²⁹

Alternative Fuels

Alternative fuel production and infrastructure will also be needed in order for SCAG to achieve its ambitious performance outcome of reducing fossil fuel use 25% below 1990 levels by 2020. The California Energy Commission (CEC) and California Air Resources Board are analyzing options to reduce the use of conventional transportation fuels through the use of alternative fuels. The CEC's 2005 Integrated Energy Policy Report describes alternative fuels. Their summary offers a glimpse into the challenges ahead for replacing fossil fuels with alternatives. For example, an increase in the amount of ethanol in gasoline will result in a loss of fuel economy and require motorists to purchase more gasoline since E-85 contains almost 30 percent less energy than gasoline. Expanded use of gas-to-liquid as a diesel fuel option will require importing large quantities to California and would face similar facility constraints as natural gas imports at the ports of Long Beach and Los Angeles. Furthermore, the federal government has approved GTL as an alternative fuel only if it is produced domestically.³⁰

Other constraints exist such as the energy balance of alternative fuels. The CEC has recently assessed the full life cycle energy inputs as mandated by Assembly Bill 1007, (Pavley) Alternative Transportation Fuels Plan. The most recent study assessed the energy inputs, greenhouse gas emissions, criteria pollutant emissions, and air toxics emissions for transportation fuels including biodiesel, conventional petroleum, electricity, ethanol, and hydrogen. For example, corn-based ethanol has higher emissions of NOx and PM10 and use petroleum in the agricultural process. As this research continues, SCAG will monitor this research and forecasting methodologies.

²⁹ Greg Kats, Capital E, The Costs and Financial Benefits of Green Buildings, A Report to California's Sustainable Building Task Force, October 2003, <http://www.ciwm.ca.gov/greenbuilding/Design/CostBenefit/Report.pdf>, last accessed September 17, 2007.

³⁰ Gas-to-liquid (GTL) is a synthetic diesel-like fuel that can be used in both conventional diesel engines and fueling systems. GTL fuel is made with a process that converts hydrocarbon gas to a liquid fuel (generally referred to as the "Fischer-Tropsch reaction").

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Renewable Energy

Additional efforts will be needed to reach SCAG's performance outcome of 20% renewable energy supply by 2010 and a longer term goal of 30% by 2020.³¹ Of the electricity consumed in the SCAG region in 2006, an average of 7 percent was generated from eligible renewables. By comparison, 10 percent of the electricity produced in California was renewable.³² However, increasing renewable energy includes tradeoffs that could impact other areas. For example, significant transmission upgrades would be needed to take advantage of resources in the Tehachapi wind and the Imperial Valley geothermal resource areas to move that energy from its source to customers. In addition, wind turbines have been found to result in bird deaths. The CEC recommends various opportunities to expand the renewable energy mix such as adopting clear and consistent policies for sustainable biomass development, taking advantage of California's abundant solar energy resources, and tapping into distributed generation and combined heat and power facilities.³³ SCAG will continue to monitor the development of these renewable resource opportunities as well as track their costs and benefits.

Public Transportation

As identified in the 2006 State of the Region, total transit boardings in the region in fiscal year 2005 increased by 16 percent from 617 million to a record high of 672 million. Nationally, transit boardings also increased at a faster rate than the population. This shift is good news since increases in public transit ridership can proportionately reduce VMT, congestion, fuel consumption and improve air quality. A recent study on public transportation found that current public transit use reduces U.S. gasoline consumption by 1.4 billion gallons each year. In a "growth scenario," the study assumed that ridership would double over current levels due to expanded transit systems, new routes, and improved land use patterns. It concluded that the total national fuel savings from public transportation would double from current savings and would equal 2.8 billion gallons per year.³⁴

b. The Proposed Plan

The demand for oil must decline at a similar rate of production in order to avert economic and social consequences of increased prices. The U.S. depends on fossil fuels for approximately 85 percent of its energy. Oil and natural gas account for approximately two-thirds of U.S. energy use, with oil accounting for 40 percent and natural gas another 23 percent. Coal, which emits more heat-trapping carbon dioxide

³¹ Renewable is defined as solar thermal, solar PV, wind, geothermal, biomass, and small hydro (less than 30 MW).

³² California Energy Commission, 2005 Gross System Electricity Production. Retrieved on February 7, 2007 from http://www.energy.ca.gov/electricity/gross_system_power.html

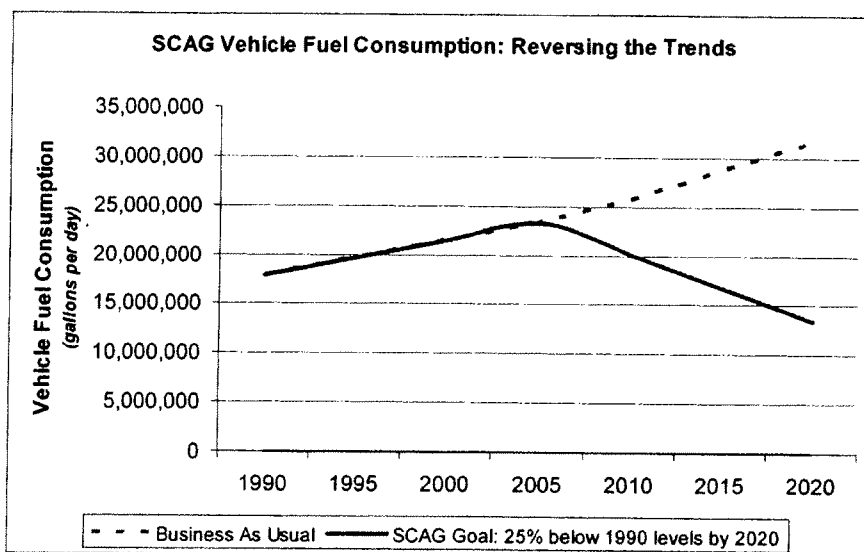
³³ Distributed generation is electricity produced on site or close to load centers that is also connected to a utility's distribution system. The most efficient and cost-effective form of distributed generation is cogeneration or combined heat and power. By recycling waste heat, these systems are much more efficient than systems that separately serve thermal and electric loads.

³⁴ ICF International. (January 2007). Public Transportation and Petroleum Savings in the U.S.: Reducing Dependence on Oil," http://www.icfi.com/Markets/Transportation/doc_files/public-transportation.pdf

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(CO₂) than oil or natural gas per unit of energy, accounts for another 22 percent. Fossil fuel use supports our current economic system including personal transportation and goods movement. Oil and natural gas are used for industrial processes, including use as feedstock, for thousands of products such as asphalt, fertilizers, pesticides, plastics, chemicals, paints, medical products, vinyl, and shoes and clothing. If oil and gas become scarce and expensive, it will have profound implications for our economy and way of life.³⁵ A recent study funded by the U.S. Department of Energy determined that viable mitigation options exist but must be initiated more than a decade in advance to avoid severe economic disruptions.³⁶ The graphic below shows the dramatic changes needed to reach the goals set forth in this plan and avert the potential economic disruptions.

Leadership is needed to coordinate and provide an ongoing forum for local and regional programs to implement an energy savings program. The RCP is leading the way in addressing our energy challenges by establishing an action plan for the region to proactively address energy uncertainty. This plan includes strategies that the region can take to reduce fossil fuel consumption and increase the use of clean, renewable technologies. SCAG will continue to work with stakeholders at the federal, state, regional and local levels to promote these policies and encourage their implementation. The remainder of this chapter will identify how to reverse the current trends and become less dependent on fossil fuels.



Source: California Department of Transportation, Division of Transportation System Information. (December 2006, November 2003). California Motor Vehicle Stock, Travel and Fuel Forecast. 1990 consumption levels are estimated based on trends.

³⁵ City of Portland Office of Sustainable Development, Bureau of Planning, and Department of Transportation. Peak Oil Task Force Briefing Book (July 25, 2006).

³⁶ Robert L. Hirsch, Roger H. Bezdek, and Robert M. Wendling, Peaking of World Oil Production: Impacts, Mitigation and Risk Management, U.S. Department of Energy, National Energy Technology Laboratory. February 2005.

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2. Goals: Defining Sustainability

a. *Reduce our region's consumption of non-renewable energy by:*

- Supplying the energy needs of the region today in a way that reduces the negative environmental impacts, social inequities, and economic hardship on future generations;
- Developing the infrastructure and social capital to adapt to a future energy economy with a constrained supply.

b. *Increase the share of renewable energy in the region by:*

- Ensuring the resiliency of the region's economy by encouraging and supporting renewable energy infrastructure; and
- Developing renewable energy sources that reduce the amount of air emissions emitted through the combustion of fossil fuels.

3. Outcomes

- a. Decrease the region's consumption of fossil fuels 25% from 1990 levels by 2020*
- b. Increase the share of renewable energy generation in the region to 20% by 2010, with additional increases to reach 30% by 2020*

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Energy Action Plan															
Constrained Policies				Potential for Direct/Indirect Benefits										Other Benefits	
IGR	Legislation	Coordination		Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change
SCAG Policies															
		◆	EN1. SCAG shall continue to work with the state to develop approaches for evaluating environmental impacts within the Compass Blueprint program, particularly energy, air quality, water, and open space and habitat. (1)	✓	✓	✓	✓	✓	✓				✓	✓	✓
▲			EN2. SCAG shall continue to develop energy efficiency and green building guidance after the RCP is adopted to provide direction on specific approaches and models and to specify levels of performance for regionally significant projects to be consistent with regional plans.	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓
		◆	EN3. SCAG shall continue to pursue partnerships with Southern California Edison and the California Public Utilities Commission to promote energy efficiency and reduce greenhouse gas emissions in the region.			✓		✓		✓					✓
		◆	EN4. SCAG shall continue to convene key decision makers to discuss energy issues and make recommendations to SCAG's Energy and Environment Committee, where appropriate.	✓	✓	✓		✓					✓	✓	✓
		◆	EN5. SCAG shall convene key stakeholders to evaluate and where feasible, recommend transportation measures such as congestion pricing, a refined regional goods movement system and an environmental mitigation strategy that reduces fossil fuel consumption.	✓	✓	✓		✓		✓					✓
	●		EN6. SCAG shall monitor and provide input towards development of state energy projections and tools, including the Integrated Energy Policy Report and similar policy documents as well as future efforts to determine the implications of energy generation and consumption for the built environment	✓	✓	✓		✓							✓

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IGR	Legislation	Coordination	Strategic Initiatives	Potential for Direct/Indirect Benefits										Other Benefits		
				Land Use and Housing	Transportation	Air Quality	Water	Energy	Open Space	Economy	Security and Emergency Preparedness	Solid Waste	Public Health	Environmental Justice	Climate Change	
SCAG Strategies																
	◆		EN INITIATIVE 1: SCAG shall consider energy uncertainty into its future planning and programming, including the Regional Transportation Plan and the Regional Transportation Improvement Program.	✓	✓	✓		✓		✓		✓				✓
	◆		EN INITIATIVE 2: SCAG shall continue to develop, in coordination with the California Air Resources Board, a data and information collection and analysis system that provides an understanding of the energy demand and greenhouse gas emissions in the SCAG Region.	✓	✓	✓	✓	✓								✓
Federal and State Government Strategies																
●			EN INITIATIVE 3: The Secretary of Energy, in coordination with other relevant federal agencies, should establish a peak oil strategy to better prepare the United States for a peak and decline in oil production. Such a strategy should include efforts to reduce uncertainty about the timing of a peak in oil production and provide timely advice to Congress about cost-effective measures to mitigate the potential consequences of a peak.			✓		✓				✓			✓	✓
●			EN INITIATIVE 4: The Federal Government should increase Corporate Average Fuel Economy (CAFE) to a level that will reduce our dependence on foreign oil and reduce greenhouse gas emissions	✓	✓	✓		✓				✓			✓	✓
●			EN INITIATIVE 5: The Federal Government should develop a national consensus on alternative fuel research and development		✓	✓		✓				✓			✓	✓
●			EN INITIATIVE 6: As recommended by the California Energy Commission, the state should continue to fund the Blueprint Planning Grant program and Blueprint Learning Network to assist regional agencies and local governments in developing regional growth plans. The	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓

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[illegible]

Design, Energy Star Homes, Green Point Rated Homes, and the California Green Builder Program. Green building standards go well beyond energy efficiency, involving use of renewable resources and reduced waste generation and water usage. Such standards can reduce local environmental impacts, regional air pollutant emissions, and global greenhouse gas emissions.

(4) Infill development encourages use of land in already developed areas as opposed to building new buildings on the outskirts. Infill involves the transformation of existing infrastructure to maximize their use potential. Infill development encourages building upwards instead of outwards. It takes advantages of unused areas and transforms them into, most typically, mixed use development. Most infill designs incorporate residential and commercial establishments in the same building. By using infill techniques, communities can save on the cost of new infrastructures and new roads. Infill projects give communities opportunities to expand while integrating new energy efficient standards.

Multiple Benefits: Successful infill development can offer these rewards for communities:

- provide housing (both affordable and market rate) near job centers and transit;
- increase the property-tax base;
- preserve open space at the edge of regions;
- provide new residents to support shopping districts and services;
- capitalize on community assets such as parks, infrastructure, and transit; and
- create new community assets such as child-care centers, arts districts, and shopping areas.

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Resources:

- Go Solar California: <http://www.gosolarcalifornia.ca.gov>
- Southern California Edison, Energy Efficiency Incentives:
<http://www.sce.com/RebatesandSavings>
- Southern California Gas Company, Energy Efficiency Incentives:
<http://www.socalgas.com/energyefficiency/>
- Federal Tax Incentives for Energy Efficiency: <http://www.energystar.gov/>